

# CLAIMS

What is claimed is at least the following:

1           1.     A data communication system, comprising:  
2                 a number of nodes interconnected in a network, the nodes including a  
3     source node, a destination node, and at least one intermediate node;  
4                 source logic in the source node to identify a data route from the source  
5     node to the destination node through the at least one intermediate node, the data route  
6     being specified by a sequence of at least one destination port value and a current hop  
7     count that are attached to a data packet to be transmitted from the source node to the  
8     destination node;  
9                 routing logic in the at least one intermediate node to route the data  
10    packet along the data route; and  
11                destination logic in the destination node to detect a final destination of  
12    the data packet.

1           2.     The system of claim 1, further comprising:  
2                 return routing logic in the at least one intermediate node to record at  
3     least one source port value of the at least one intermediate node in the data packet; and  
4                 wherein a total hops value is attached to the data packet.

1           3.     The system of claim 1, further comprising a routing table located in the  
2     source node, the routing table containing at least one data route from the source node  
3     to the destination node.

1           4.     The system of claim 1, wherein the routing logic further comprises  
2 logic to decrement the current hop count.

1           5.     The system of claim 2, wherein the return routing logic further  
2 comprises logic to replace the at least one destination port value in the data packet  
3 with the source port value of the at least one intermediate node.

1           6.     A data communication system, comprising:  
2                   a number of nodes interconnected in a network, the nodes including a  
3 source node, a destination node, and at least one intermediate node;  
4                   path identification means in the source node for identifying a data route  
5 from the source node to the destination node through the at least one intermediate  
6 node, the data route being specified by a sequence of at least one destination port  
7 value and a current hop count that are attached to a data packet to be transmitted from  
8 the source node to the destination node;  
9                   routing means in the at least one intermediate node for routing the data  
10 packet along the data route; and  
11                  destination means in the destination node for detecting an arrival of the  
12 data packet at the destination node.

1           7.     The system of claim 6, further comprising:  
2                   return routing means in the at least one intermediate node for  
3 recording at least one source port value of the at least one intermediate node in the  
4 data packet; and  
5                   wherein a total hops value is attached to the data packet.

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1           8.       The system of claim 6, further comprising a routing table located in the  
2 source node, the routing table containing at least one data route from the source node  
3 to the destination node.

1           9.       The system of claim 6, wherein the routing means further comprises  
2 means for decrementing the current hop count.

1           10.      The system of claim 7, wherein the return routing means further  
2 comprises means for replacing the at least one destination port value in the data packet  
3 with the source port value of the at least one intermediate node.

1           11.      A method for data communications, comprising the steps of:  
2                   generating a data packet to transmit from a source node to a destination  
3 node through at least one intermediate node in a network;  
4                   identifying a data route from the source node to the destination node  
5 through the at least one intermediate node, the data route being specified by a  
6 sequence of at least one destination port value and a current hop count that are  
7 attached to the data packet to be transmitted from the source node to the destination  
8 node;  
9                   routing the data packet along the data route in the at least one  
10 intermediate node; and  
11                  detecting an arrival of the data packet in the destination node.

1           12. The method of claim 11, further comprising the steps of:  
2           attaching a total hops value to the data packet; and  
3           recording at least one source port value of the at least one intermediate  
4           node in the data packet in the at least one intermediate node.

1           13. The method of claim 11, wherein the step of identifying a data route  
2           from the source node to the destination node through the at least one intermediate  
3           node further comprises the step of examining a routing table located in the source  
4           node, the routing table containing at least one data route from the source node to the  
5           destination node.

1           14. The method of claim 11, wherein the step of routing the data packet  
2           along the data route in the at least one intermediate node further comprises the step of  
3           decrementing the current hop count.

1           15. The method of claim 12, wherein the step of recording at least one  
2           source port value of the at least one intermediate node in the data packet in the at least  
3           one intermediate node further comprises the step of replacing the at least one  
4           destination port value in the data packet with the at least one source port value of the  
5           at least one intermediate node.